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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/806,217	03/23/2004	Yi-Chun Huang	0941-0935PUS1	1669
2292	7590	09/16/2005		
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER PRENTY, MARK V	
			ART UNIT	PAPER NUMBER

2822

DATE MAILED: 09/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/806,217

Applicant(s)

HUANG ET AL.

Examiner

MARK PRENTY

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 12-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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This Office Action is in response to the response filed on September 6, 2005.

Applicant's election with traverse of Group I, claims 1-11, is acknowledged. The traversal is on the ground that "it should be no undue burden on the Examiner to consider all claims in the single application." This is not found persuasive because, as explained in the restriction requirement, the two inventions are distinct and have acquired a separate status in the art, and thus it would be an undue burden on the examiner to consider all the claims.

The requirement is still deemed proper and is therefore made FINAL.

Claims 12-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention.

Independent claim 1 is objected to because "small" should read "smaller". Correction is required. Claims 2-5 depend on claim 1 and are thus similarly objected to.

Claims 8 and 10 are objected to because "the metal silicide layer" lacks antecedent basis. Correction is required (i.e., claims 8 and 10 should apparently depend on claim 7, which recites a metal silicide layer).

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent 6,707,117 to Vashchenko et al. (Vashchenko).

With respect to independent claim 1, Vashchenko discloses a semiconductor device (see the entire patent, including the Fig. 3 disclosure), comprising: a semiconductor device body exposing at least one silicon-containing portion 214; a metal silicide layer 250 with a first resistivity overlying the silicon-containing portion; and a

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(metal) conductor layer 290 with a second resistivity overlying the metal silicide layer, wherein the second resistivity is small[er] than the first resistivity.

Claim 1 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Vashchenko.

With respect to dependent claim 2, Vashchenko's conductor layer 290 comprises the same type metal ion (cobalt, for example) as that of the metal silicide layer 250.

Claim 2 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Vashchenko.

With respect to dependent claim 3, Vashchenko's conductor layer 290 comprises refractory metal (cobalt, for example).

Claim 3 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Vashchenko.

With respect to dependent claim 4, Vashchenko's metal silicide layer 250 comprises a silicide of refractory metal (cobalt, for example).

Claim 4 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Vashchenko.

With respect to dependent claim 5, Vashchenko's conductor layer 290 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 3, lines 32-45).

Claim 5 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Vashchenko.

Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent 6,521,956 to Lee.

With respect to independent claim 1, Lee discloses a semiconductor device (see the entire patent, including the Fig. 1b disclosure), comprising: a semiconductor device body exposing at least one silicon-containing portion 300; a metal silicide layer 240 with a first resistivity overlying the silicon-containing portion; and a (metal) conductor layer 220 with a second resistivity overlying the metal silicide layer, wherein the second resistivity is small[er] than the first resistivity.

Claim 1 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 2, Lee's conductor layer 220 comprises the same type metal ion as that of the metal silicide layer 240 (see column 3, lines 42-44).

Claim 2 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 3, Lee's conductor layer 220 comprises refractory metal (cobalt – see column 3, lines 42-44).

Claim 3 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 4, Lee's metal silicide layer 240 comprises a silicide of refractory metal (cobalt – see column 3, lines 42-44).

Claim 4 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

With respect to dependent claim 5, Lee's conductor layer 220 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 3, lines 42-44).

Claim 5 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Lee.

Claims 1-11 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent 6,548,877 to Yang et al. (Yang).

With respect to independent claim 1, Yang discloses a semiconductor device (see the entire patent, including the Fig. 8 disclosure), comprising: a semiconductor device body 200 exposing at least one silicon-containing portion 230; a metal silicide layer 261 with a first resistivity overlying the silicon-containing portion; and a (metal) conductor layer 290 with a second resistivity overlying the metal silicide layer, wherein the second resistivity is small[er] than the first resistivity.

Claim 1 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 2, Yang's conductor layer 290 comprises the same type metal ion as that of the metal silicide layer 261 (see column 7, lines 45-46, and column 4, lines 45-50).

Claim 2 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 3, Yang's conductor layer 290 comprises refractory metal (see column 7, lines 45-46).

Claim 3 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 4, Yang's metal silicide layer 261 comprises a silicide of refractory metal (see column 4, lines 45-50).

Claim 4 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 5, Yang's conductor layer 290 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 7, lines 45-46).

Claim 5 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to independent claim 6, Yang discloses a resistance-reduced transistor (see the entire patent, including the Fig. 8 disclosure), comprising: a silicon substrate 200 having a gate stack formed thereon, wherein the gate stack exposes a silicon gate electrode 220; a pair of source/drain regions 230, oppositely disposed in the silicon substrate adjacent the gate stack; and a metallized bilayer 261/290 and 280/290 overlying each source/drain region and the silicon gate electrode to thereby reduce resistance thereof, wherein the metallized bilayer comprises a metal top layer 290.

Claim 6 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 7, Yang's transistor further comprises a metal silicide layer 261, 280 disposed between the metal top layer 290 and each source/drain region and the silicon gate electrode.

Claim 7 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 8, Yang's metal top layer 290 comprises the same type of metal ion as that of the metal silicide layer 261, 280 (see column 7, lines 45-46, and column 7, lines 20-25).

Claim 8 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 9, Yang's metal top layer 290 comprises refractory metal (see column 7, lines 45-46).

Claim 9 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 10, Yang's metal silicide layer 261, 280 comprises a silicide of refractory metal (see column 7, lines 20-25).

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Claim 10 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

With respect to dependent claim 11, Yang's metal top layer 290 comprises metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 7, lines 45-46).

Claim 11 is thus rejected under 35 U.S.C. 102(e) as being anticipated by Yang.

Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent 6,369,429 to Pramanick et al. (Pramanick).

With respect to independent claim 1, Pramanick discloses a semiconductor device (see the entire patent, including the Fig. 5 disclosure), comprising: a semiconductor device body 10 exposing at least one silicon-containing portion 11B; a metal silicide layer with a first resistivity overlying the silicon-containing portion (see the paragraph bridging columns 4 and 5); and a (metal) conductor layer 50 with a second resistivity overlying the metal silicide layer, wherein the second resistivity is small[er] than the first resistivity.

Claim 1 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 2, Pramanick's conductor layer 50 comprises the same type metal ion (cobalt) as that of the metal silicide layer (see the paragraph bridging columns 4 and 5).

Claim 2 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 3, Pramanick's conductor layer 50 comprises refractory metal (see column 6, line 24).

Claim 3 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 4, Pramanick's metal silicide layer comprises a silicide of refractory metal (see the paragraph bridging columns 4 and 5).

Claim 4 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 5, Pramanick's conductor layer 50 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 6, line 24).

Claim 5 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to independent claim 6, Pramanick discloses a resistance-reduced transistor (see the entire patent, including the Fig. 5 disclosure), comprising: a silicon substrate 10 having a gate stack formed thereon, wherein the gate stack exposes a silicon gate electrode 13; a pair of source/drain regions 11B, oppositely disposed in the silicon substrate adjacent the gate stack; and a metallized bilayer overlying each source/drain region and the silicon gate electrode to thereby reduce resistance thereof, wherein the metallized bilayer comprises a metal top layer 50 (and an underlying silicide layer – see the paragraph bridging columns 4 and 5).

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Claim 6 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 7, Pramanick's transistor further comprises a metal silicide layer disposed between the metal top layer 50 and each source/drain region and the silicon gate electrode (see the paragraph bridging columns 4 and 5).

Claim 7 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 8, Pramanick's metal top layer 50 comprises the same type of metal ion as that of the metal silicide layer (see the paragraph bridging columns 4 and 5).

Claim 8 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 9, Pramanick's metal top layer 50 comprises refractory metal (see column 6, line 24).

Claim 9 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

With respect to dependent claim 10, Pramanick's metal silicide layer comprises a silicide of refractory metal (see the paragraph bridging columns 4 and 5).

Claim 10 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

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With respect to dependent claim 11, Pramanick's metal top layer 50 comprises metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 6, line 24).

Claim 11 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pramanick.

Claims 1-11 are rejected under 35 U.S.C. 102(b) as being anticipated by United States Patent 6,316,811 to Pey.

With respect to independent claim 1, Pey discloses a semiconductor device (see the entire patent, including the Fig. 7 disclosure), comprising: a semiconductor device body exposing at least one silicon-containing portion 20; a metal silicide layer 24 with a first resistivity overlying the silicon-containing portion; and a conductor layer 26 (comprising low resistivity titanium silicide or tungsten – see column 3, lines 38-54) with a second resistivity overlying the metal silicide layer, wherein the second resistivity is small[er] than the first resistivity.

Claim 1 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 2, Pey's conductor layer 26 comprises the same "type" metal ion (i.e., refractory metal type) as that of the metal silicide layer 24 (i.e., layer 26's titanium or tungsten and layer 24's titanium are refractory metals).

Claim 2 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 3, Pey's conductor layer 26 comprises refractory metal (titanium or tungsten).

Claim 3 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

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With respect to dependent claim 4, Pey's metal silicide layer 24 comprises a silicide of refractory metal (i.e., titanium – see column 3, lines 29-31).

Claim 4 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 5, Pey's conductor layer 26 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (see column 3, lines 38-54).

Claim 5 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to independent claim 6, Pey discloses a resistance-reduced transistor (see the entire patent, including the Fig. 7 disclosure), comprising: a silicon substrate 10 having a gate stack formed thereon, wherein the gate stack exposes a silicon gate electrode 16; a pair of source/drain regions 20, oppositely disposed in the silicon substrate adjacent the gate stack; and a metallized bilayer 24/26 overlying each source/drain region and the silicon gate electrode to thereby reduce resistance thereof, wherein the metallized bilayer comprises a metal top layer 26 (i.e., tungsten – see column 3, lines 51-54).

Claim 6 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 7, Pey's transistor further comprises a metal silicide layer 24 disposed between the metal top layer 26 and each source/drain region and the silicon gate electrode.

Claim 7 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 8, Pey's metal top layer 26 comprises the same "type" of metal ion (i.e., refractory metal type) as that of the metal silicide layer 24 (i.e., layer 26's tungsten and layer 24's titanium are refractory metals).

Claim 8 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 9, Pey's metal top layer 26 comprises refractory metal (i.e., tungsten – see column 3, lines 51-54).

Claim 9 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

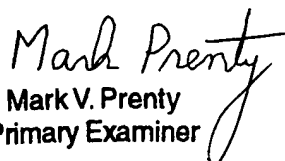
With respect to dependent claim 10, Pey's metal silicide layer 24 comprises a silicide of refractory metal (titanium – see column 3, lines 29-31).

Claim 10 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

With respect to dependent claim 11, Pey's metal top layer 26 comprises a metal selected from a group consisting of Au, Pt, Ni, Co, Pd, W and Ti (i.e., tungsten - see column 3, lines 51-54).

Claim 11 is thus rejected under 35 U.S.C. 102(b) as being anticipated by Pey.

Registered practitioners can telephone the examiner at (571) 272-1843. Any voicemail message left for the examiner must include the name and registration number of the registered practitioner calling, and the Application/Control (Serial) Number. Technology Center 2800's general telephone number is (571) 272-2800.


Mark V. Prenty
Primary Examiner